CSE and Teachers of English to Speakers of Other Languages: A Call for Greater Collaboration in Teaching Scientific Reporting

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Abstract

Teachers of English to scientists who are native speakers of other languages often have limited resources for teaching the principles and conventions of publication in the English-language scientific literature. Therefore, the scientists they teach might have little opportunity to learn standards of scientific reporting while they improve their skills at communicating in English. Collaboration between the Council of Science Editors and organizations that represent those English teachers would benefit science by promoting high standards of scientific reporting internationally.

Introduction

Thousands of English teachers worldwide work with scientists whose native language is not English, giving them tools to write research reports in English and to make scientific presentations that their English-speaking colleagues can understand. When those scientists are students, the teachers help them develop language skills to serve them as they prepare for careers in which success can be proportional to their ability to communicate in English. Some of the teachers are skilled in scientific writing, but many more are pressed into service because they are the only speakers of English for miles around. These teachers may also be called on to work with individual scientists as author's editors to help them write reports to give to their chief scientists, to present at meetings, or to submit to English-language journals.

Although these teachers help the scientists to communicate clearly in English, many are limited by a lack of background in the specialized English of science and technology and in the conventions of the English-language scientific community. Many of the teachers seek support from their international professional organizations—Teachers of English to Speakers of Other Languages (TESOL), founded in the United States, and the International Association of Teachers of English as a Foreign Language (IATEFL), founded in Britain. These organizations offer some resources with regard to scientific reporting, but they focus largely on linguistic analysis, knowledge of how language is learned, and effective teaching methods. For TESOL and IATEFL members working in science and technology, the resources and training opportunities provided by the Council of Science Editors (CSE) would be highly relevant. In turn, for editors of scientific journals published in English, those teachers would be valuable allies in helping to raise standards of scientific reporting and publication internationally.

This article is written to inform CSE members about teachers of English to scientists who are not fluent in the language and to propose an active liaison between CSE and the teachers' professional organizations.

Development of English-Language Teaching Programs

Teaching English to speakers of other languages emerged as a profession during the 1960s. TESOL was founded in 1966. It now has more than 18,000 members internationally and is affiliated with 43 independent organizations in the United States and 47 abroad, representing more than 50,000 members worldwide. A year after TESOL was founded, the British organization IATEFL was founded with similar goals. IATEFL now has a membership of over 11,000 members in more than 112 countries. As international communication improves, many teachers are participating in both organizations.

In the United States, the profession is known by the acronym TESOL (teaching English to speakers of other languages). In Britain, it is known as ELT (English language teaching). TESOL and ELT have different approaches according to the population served. In countries where English is not a primary language of communication, the approach is called teaching English as a foreign language (EFL). Teaching English to non-native-English speakers living in a country where English is the major language of communication is called teaching English as a second lan-

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guage (ESL). The two approaches differ in some respects.

Generally, teachers of English to speakers of other languages are prepared to teach at the elementary- and secondary-school level or at the university level. Requirements for these teachers vary by state, province, and country. Typically, the teachers-in-training must receive an introduction to the role of language in education, and they must learn about the structure and phonology of English, the relationship of language and culture, basic methods of language teaching, and the preparation of lessons and teaching materials. They observe classes taught by experienced teachers and serve a period of practice teaching. Some new teachers learn about language testing and are exposed to research on the processes by which people acquire a second language. The degree of expertise and the knowledge and skill of individual teachers in these areas vary with the level of certification and the institution awarding it. Among individual teachers, proficiency in the English language also varies; in many regions English is not the native language of the teachers.

In the past most teachers of English to speakers of other languages taught within a country's national education system at the elementary, secondary, and university levels. Increasingly, however, teachers are finding positions in other venues, from community adult-education programs to custom-made training programs sponsored by universities, corporations, and other institutions. Although some teachers who work with learners in the various professions trained formally in a related discipline before turning to a career in teaching English for science and technology, many have had no formal training with regard to the English communication needs in the learner's workplace. Some have gained insights from community adult-education programs, from exposure to workplace settings through family connections, from presentations or workshops at professional conferences, or from articles in professional journals. Until recently, however, most have learned on the job.

The situation has changed. As a result of British Council efforts that have promoted English around the world, Great Britain has been a leader in establishing training programs to prepare teachers to teach English in a variety of academic and workplace settings. Australia also has been a strong force in introducing such training programs. Efforts have been more sporadic in the United States, but instruction in teaching English for scientific and other uses has gradually been introduced into some teacher-training programs. TESOL and IATEFL support English teachers in academia and industry by sponsoring programs for interest groups concerned with teaching English for specific purposes.

English for Specific Purposes

The establishment of English for specific purposes (ESP) as a subspecialty in language instruction is derived from a scientific approach, first described by Barber in 1962, to the study of specialized language varieties.[1,2] During the 1970s, doctors, lawyers, and business professionals in the United States were increasingly concerned about language as related to problems with communication in their work—for example, with regard to the comprehensibility of legal documents or to real or potential miscommunication between medical personnel and patients. The interests of linguists and the professions coincided as linguists were introduced to a variety of language problems from professional contexts and as the professions were introduced to the resources that linguists could provide to help them cope with language problems in the workplace.[3] The situation produced an increased demand for teachers of ESP as increasing numbers of nonnative speakers entered the professions in English-speaking countries, especially in medicine and allied health care. Similar concerns have developed around the world in the teaching of other languages, producing an even broader field called language for specific purposes.

A subspecialty of ESP, English for science and technology (EST), grew out of analyses of scientific research articles and other scientific texts, mainly by teachers and linguists in EFL settings.[1,2,4] Barber's published statistics gave teachers of EST support to argue for the existence of a specialized language of science and technology beyond simply a technical or specialized vocabulary. Extensive research has continued on the scientific journal article. Major research trends have included the examination of lexicostatistics,[1] patterns in contrastive rhetoric, and, spurred by the critical work of Swales,[5,6] the journal article as a genre. Through the influences of anthropology and sociolinguistics, the sociocultural contexts of communication gained importance in the analysis of meaning in language, and the importance of ethnographic studies was recognized.[2] Today the recognition of a professional culture is the point at which educators begin assessing the need for English-language instruction, for other communication skills, and for language-adapting strategies within the culture. It has been contended that the analysis of meaning in *language* used in a specific sociocultural context should be broadened to become the analysis of meaning in *communication* in the context in question.[7]

Both TESOL and IATEFL have designated interest groups that emphasize English for communication in specific work contexts, professions, disciplines, or vocations. TESOL is now completing a set of process standards and best practices for workplace language-training programs.

Needs Assessment and Focused Instruction

Needs for language training vary. A needs assessment is critical to identifying the breadth and depth of learners' needs for language and other communication skills in their specific fields. Needs assessments and establishment of appropriate priorities for teaching English-language skills consider not only the needs and priorities of the learner, but also those of the key consumers of the learner's language. ESP teachers differentiate between the needs of people preparing to enter a field of work who will use English for academic and vocational purposes and those of professionals who are already experts in their fields. A French speaker studying medicine in the

United States and a Mexican obstetrician who occasionally treats an expatriate or tourist have different needs for learning English. Some scientists and professionals need English mainly to read professional journals or write articles. Others need interactive communication skills to attend professional conferences or host visiting scientists. Still others wish to do research in English-speaking countries. Some pursuing careers in global, high-technology corporations need English to negotiate complex social situations, as well as for scientific exchange. Needs assessment, then, drives the objectives of the English courses and the content of activities and materials.

In various fields of applied linguistics, research is done on communication needs of language learners who are developing their expertise or are already in their professions. However, findings from this research are relatively inaccessible to many teachers who are designing ESP courses, and there is often little exchange between researchers and teachers who are designing courses to meet immediate needs. Because these factors are often compounded by heavy teaching demands, many designers of ESP courses begin their work without detailed analyses. The resulting programs are sometimes adequate, sometimes not. Their efficacy depends not only on the teacher's knowledge but also on the appropriateness of the approach used—the degree to which the teaching materials are authentic and appropriate in both language and task for the learner's professional needs, reflect the professional culture, and build on what the learner brings to the learning situation.[8,9]

Teachers of general English-proficiency courses often feel frustrated because, in the time available for classes, they cannot teach every aspect of the language that they think learners should know. In contrast, ESP teachers recognize that for scientists English is a tool for professional communication, not an end in itself. Through needs assessment and establishment of priorities among learners' needs, teachers of ESP come to recognize that they do not have to try to cover every aspect of the language. Instead, they focus on selected language communication skills that the learner considers most important. In principle, and often in practice, this focus results in greater efficiency of both teaching and learning. Learners and the consumers of their language see both relevance and visible results, and those results increase the learners' motivation.

The Essential Role of Collaboration

When asked to teach English to learners from disciplines in which they have little or no background, ESP teachers soon recognize that they cannot—and should not—approach the task as experts in the learners' fields. Teachers who make careers in ESP regard themselves as specialists in helping learners to communicate their ideas effectively in English.[8,9] Keen to bring relevance to every lesson, they mine their learners' experience and the work of other specialists in the learners' fields for the linguistic and cultural content on which to base their courses.

Collaboration becomes a way of life for teachers of ESP. Formalizing the somewhat casual support previously given, the English-teaching unit at one university in a country where English is a foreign language now delivers formal English-communication support not only to students but also to faculty members writing journal articles and going to conferences abroad. At this university some science professors who are required to give some or all of their lectures in English can now discreetly ask for English tutoring.[10] Collaborating with visiting native-English-speaking scientists, a teacher in China compiled a library of videotaped lectures and language-support materials to serve as a resource for the university. At that time there were few opportunities to hear or talk with native speakers of English. In Hong Kong ESP teachers collaborated with a medical faculty member in teaching physiotherapy students about a key subject of research: pain theory.

Complementing this practice of ESP teachers' continuing to learn from their students and the consumers of their students' language is a long history of collaboration with other disciplines and professions in countries around the world. Establishing formal and informal collaboration with fields in which English-language learners study and work is a goal of TESOL's ESP interest section. Informal collaboration between TESOL and CSE members began with a study that evaluated how values in medicine and life sciences are transmitted by the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals"[11] and that assessed possible differences around the world.[12]

Members of TESOL's ESP interest section have been exposed to the resources that CSE can offer them in programs that one of us (MvN) has organized for TESOL's international conferences. A colloquium on collaboration between professional science editors and writing specialists in the field of English for science and technology, presented at a TESOL conference in 1994, brought together editors from a variety of disciplines, including a representative of CSE.[13] This colloquium introduced ESP teachers to the role of the science editor and to new cross-disciplinary professional resources. In return it gave the editors an opportunity to learn more about issues related to working with nonnative English-speaking scientists.

The next year a full-day course on the language and culture of scientific literature,[14] developed by one of us (SE) in collaboration with two TESOL members, was presented before the TESOL conference. This course gave ESP teachers authentic teaching materials, devoted substantial time to principles of scientific reporting and to precision in language and graphic presentation, defined ethical responsibilities in scientific publication, and provided an opportunity for participants to discuss ethical issues in the sciences. A contribution by a CSE member to an ESP textbook[15] has given teachers authentic teaching materials and promoted the use of guides to high-quality, ethical scientific writing.[16]

Greater collaboration between CSE and the ESP interest groups TESOL and IATEFL can improve the teaching of scientists who are not fluent in English,

enabling them to increase both their ability to communicate in English and their scientific reporting skills. The work of ESP teachers can benefit vastly from the expertise of CSE, the training opportunities that CSE offers, and the professional documents that CSE has developed, such as the book *Ethics and Policy in Scientific Publication*,[17] an invaluable resource for case studies and discussions of ethical issues. Also those teachers can disseminate information about CSE's resources to individual scientists, research faculties, and scientific institutions worldwide while at conferences, through publications, via electronic discussion lists (such as *EST-L@asu.edu*), and on Web sites (for example, Resources for Teachers of English for Science and Technology at *www.u-aizu.ac.jp/~t-orr/est1.html* and TESOL's English for Specific Purposes Interest Section Web site at *www.tesol.org/isaffil/intsec/f-esp.html*).

Those and other resources can help teachers discover ways to work with scientists whose primary language is not English. They also can encourage scientists to educate their colleagues about communication in the scientific literature.[18] Collaboration in giving workshops abroad would be fruitful. For example, in Sri Lanka and Egypt government-funded workshops in English for science and technology were enriched by the use of CSE materials—but how much more effective they might have been with a science editor participating!

The professional organizations TESOL and IATEFL are working to improve teaching criteria and to set standards for teachers of English around the world. With collaboration between CSE and these organizations, teachers of scientists who are not fluent in English can develop more effective and educational coursework and can increase scientists' understanding of the standards of scientific reporting through their work as author's editors. This collaboration can also help to improve manuscripts submitted to journals and simultaneously give a greater voice to scientists who are not native speakers of English.

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